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SOME MEXICAN FROGS.

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Herpetological collections made in Mexico during the summer of 1940, by my son Richard C. Taylor and myself, disclose the presence of two new Eleutherodactylid frogs in southern Mexico. The collections also show that the form *Hylodes calcitrans* Günther synonymized with *Eleutherodactylus mexicanus* (Brocchi) should be recognized as a distinct species; and furthermore that *Borborocoetes mexicanus* Boulenger is specifically distinct from *Eleutherodactylus mexicanus* (Brocchi), but generically the same. Since the specific name is preoccupied, a new name is being proposed for the species.

Microbatrachylus lineatissimus, sp. nov.

Type.—EHT–HMS No. 24289, adult male, Cerro San Felipe, near Oaxaca, Oaxaca; elevation between 7,000 and 8,000 ft., July, 1940; E. H. Taylor and R. C. Taylor, Colls.

Paratypes.—EHT–HMS Nos. 24287, 24288, 24290. Same data as type.

Diagnosis.—Tibiotarsal articulation reaching beyond tip of snout; vomerine teeth present, but extremely small, sometimes concealed, widely separated; no inner tarsal fold or tubercle; inner metatarsal tubercle rather large; inguinal gland very large, distinct, yellowish; two pairs of dorsal glandular folds continue nearly to end of the body; a fold from above tympanum continues some distance on the sides; between the middle pair of dorsal folds a faint median ridge present; between each middle fold and the dorsolateral fold another more or less discontinuous fold; first finger shorter than second.

Description of the type.—Adult male. Head length (9.6 mm.) greater than width (8.5 mm.); interorbital distance (2 mm.) about equal to width of an eyelid (2.05 mm.); diameter of tympanum (2.95 mm.) greater than diameter of eye (2.65 mm.); eye to nostril, 2 mm.; eye to tip of snout, 3.95 mm.; distance between nostrils, 3 mm.; canthus well defined; lores sloping, slightly concave behind nostrils; length of snout, 3.8 mm. A faint

median ridge from snout to rump; beginning on top of eyelid at a large pustule is a glandular fold which passes with its fellow to rump where they may continue somewhat farther as a series of irregular tubercles; beginning on top of eyelid at a second tubercle is another less distinct, more or less discontinuous ridge, which parallels the other ridge and which can be traced to the sacral region; back of, and somewhat higher than the posterior corner of eye, a third lateral fold begins as a series as two or three tubercles and continues to the lumbar region where it terminates, its posterior end being elevated and curving outwards almost to groin; a heavy supratympanic fold continues above arm and may be traced some distance on side as a row of irregular tubercles; the flat inguinal gland that borders the thigh is about 2.5 x 2.5 mm., the outline not circular; axillary gland small, scarcely discernible from other tubercles save by the yellowish color; ventral disk distinct, smooth; the posterior border (seemingly) minutely in front of femur (attached on femur in paratypes); chin and throat smooth; postympanic fold not close to tympanum, thickened greatly above arm; a strong, elongate tubercle between tympanum and arm insertion; sides with numerous pustular tubercles; tympanum with a continuous, strongly raised rim, save on the upper edge, its distance from eye less than one-third of its diameter; choanae small, partially concealed by overhanging flange of jaw when seen from below; vomerine tooth patches faintly discernible, their distance from choanae greater than distance between them; tongue somewhat oval behind, not emarginate, narrowing in front; no vocal sacs.

Arm moderately long, the subarticular tubercles well developed, and several supernumerary palmar tubercles; median palmar tubercle largest, confluent with the posterior part of the outer palmar tubercle; first finger shorter than second; a row of indistinct tubercles on under surface of arm; tips of digits thickened but only very slightly expanded; leg long, the tibio-tarsal articulation reaching much beyond the tip of snout; no inner tarsal fold or tubercle; a row of four tubercles on outer edge of tarsus; inner metatarsal tubercle large, oval, its length three-fourths to four-fifths the length of first toe; outer tubercle, nearly half size of inner, well defined, salient; third toe larger and very slightly longer than fifth; a few traces of supernumerary tubercles, but these are obsolete for most part; none or only faintest trace of web between digits; tibia and femur irregularly tubercular above, the larger granules forming irregular transverse rows when limbs are folded; when limbs are folded at right angles the heels overlap 2½ mm.; ventral and inner posterior surface of femur largely granular.

Coloration.—Gray to gray-brown above, with series of dim linear markings, the most conspicuous being between the middle dorsal folds and separated by a hair-fine, lighter line; the outer edge of the dorsolateral fold is dark, with spots or flecks; a blackish line from snout to eye, and several black spots above and behind tympanum; lips with irregular darker spots; hind legs barred with darker; a white spot on dorsal surface of heel; sole and palm purplish, the tubercles whitish; chin, throat, and part of

abdominal surfaces with scattered dark pigment; groin and part of anterior femoral surface without pigment.

Variation.—The paratypes agree in all essential details. Some differences in the shade of color are discernible and some of the specimens show faint dermal ridges on either side of the median line of the snout. In females the tympanum is a little smaller than eye, and the rim is less elevated. The inguinal glands may be a little smaller in females; the axillary gland is not discernible in one case.

Measurements (in mm.): *Microbatrachylus lineatissimus*, sp. nov.

Number—EHT–HMS	24289	24288	24290	24287
Sex	♂	♂	♂	♂
Snout to vent	20	19	21	18.8
Width of head	8.5	8	8.8	8.5
Length of head	9.6	9	9.5	9
Diameter of eye	2.65	2.5	3	2.3
Diameter of tympanum	2.95	2.65	2.9	2.6
Eye to nostril	2	2.1	2	1.9
Length of snout	3.8	3.4	4	3.3
Arm	11	12	12	12
Leg	39	35	39	34
Tibia	13.1	11.3	12.8	11.2
Foot	16	16.2	15.8	16.1

Remarks.—This form agrees generically with *Microbatrachylus* save for the appearance of minute teeth. The presence or absence of teeth is variable in various Eleutherodactylid genera (notably *Syrrhophus latodactylus* where they are probably normally absent but occur occasionally, and *Eleutherodactylus calcitrans* where teeth are normally present but may be absent). The presence of vomerine teeth should not invalidate the recognition of the form as a member of the genus *Microbatrachylus*. In the absence of the tarsal fold, the presence of a large inguinal gland, the character of the ventral disk and the absence of vocal sacs, and presence of the heavily pigmented testicular sac, it agrees with other species of the genus.

It is probable that the female will be found to be larger than the male and the tympanum will be proportionally smaller than in the male.

Specimens were obtained in the edge of a cultivated field about sundown. They had apparently just entered the field from the adjoining forest. Two other species were found here, *Microbatrachylus oaxacae* Taylor and *Eleutherodactylus mexicanus* (Brocchi).

Eleutherodactylus saltator, sp. nov.

Type.—EHT–HMS No. 24301; adult female; Omilteme, Guerrero, about 8,000 ft.; August 2, 1940; E. H. Taylor Collector.

Paratypes.—EHT–HMS Nos. 24293, 24298, 24299; same data; August 2–4, 1940.

Diagnosis.—Related to *Eleutherodactylus calcitrans* but differing in

having much longer legs, the tibiotarsal articulation reaching much beyond tip of the snout instead of to eye or nostril; in having the inner metatarsal tubercle less than half the size; when the limbs are folded at right angles, the heels overlap much more; the terminal digital pads are larger than in *calcitrans*. No tubercle or fold on inner part of tarsus; length of body much less than length from vent to heel.

Description of the type.—Adult female. Width of head (18.3 mm.); a little greater than length (16.5 mm.); tympanum a little higher than wide, its greatest diameter (vertical, 4 mm.) less than diameter of eye (4.7 mm.); distance of eye to nostril (4 mm.) less than eye; eye to tip of snout 7 mm.; distance between nostrils 4.9 mm.; length of snout 6.3 mm.; interorbital distance (4.9 mm.) greater than width of an eyelid (3.5 mm.).

Skin above generally smooth with practically no trace of dorsal folds, but with very minute granules visible (under lens) posteriorly; a fold above tympanum continues to above arm; a downward branch of this fold continues down and back, terminating above arm; fold covers upper edge of tympanum; two small tubercles between tympanum and arm; canthus distinct, moderately sharp; the lores sloping somewhat, concave behind nostril; snout oval, rather pointed; sides of body with some rugosities; ventral surfaces of chin and venter smooth; inguinal gland distinct, yellowish.

Choanae rather large, not concealed by overhanging shelf of jaw; vomerine teeth in two small diagonal groups separated by a distance greater than half their length; they lie behind, and within level of choanae and send a slight ridge toward their inner edge; tongue large, somewhat subcircular, lacking posterior emargination; vocal sacs apparently absent in males; membranes of mouth show much grooving; palate with minute granules or papules.

Arm relatively short, the wrist not reaching beyond tip of snout; no tubercles under forearm; the large median palmar tubercle partially confluent with the smaller outer palmar tubercle, the inner nearly as large as middle one; supernumerary palmar tubercles low; subarticular tubercles large; digital dilations of finger less than toes, the transverse terminal grooves probably indistinct or wanting (unless digit is slightly dried); first finger slightly shorter than second; leg very long, when folded at right angles to body the heels overlap 4 mm.; tibiotarsal articulation reaches beyond tip of snout, a distance equal to the length of the snout; no inner tarsal fold or tubercle; four very dim outer tubercles on tarsus; third and fifth toes reach forward same distance; inner metatarsal tubercle elongate, oval, its length contained once and a half in length of the first toe; subarticular tubercles prominent; a single supernumerary tubercle indicated (under magnification two or three can be discerned in some of the paratypes); part of ventral and posterior surfaces of femur granular; ventral disk strongly indicated, but the posterior limit is not distinct.

Color.—Above variegated lavender, growing more dense and darker on head; loreal region dark, with some spots below canthus and on lips; a dark stripe from eye follows the supratympanic fold; arms and legs barred dimly; surface of hands and feet purplish, the edges of the digit slighter;

tubercles on digits purplish; flesh-white below, with a scattering of pigment, heaviest on chin; posterior surface of femur well pigmented.

MEASUREMENTS OF *Eleutherodactylus saltator* IN MM.

Number	24301	24299	24293	24298
Sex	♀	♀	♀	♂
Snout to vent	44	29	32	22
Width of head	18.3	12	12.8	9
Length of head	16.5	12.9	13.5	10
Diameter of tympanum (vertical)	4	3	3	3
Diameter of eye (long.)	4.7	3.8	4	3
Eye to nostril	4	3	3.5	2.5
Length of snout	6.3	5	5.2	4
Arm	26.2	18.5	19	14.5
Leg	86	58	63	42.2
Tibia	28	20	21	14
Foot	37	24	27	19.6

Remarks.—This very distinctive form, resembling superficially the *Eleutherodactylus calcitrans* was taken near the mountain summits (8,000 ft.) in the region about Omilteme. The very long limb, and the reduced inner metatarsal tubercle will serve readily to distinguish the two forms.

I thought at first that the *Syrrhophus omiltemanus* Günther might be identified with this form. The fact that the abdomen is described as "coarsely granular" and "one metatarsal tubercle," "disks of fingers and toes exceedingly small" point to the strong probability that it is a young *E. calcitrans*. Kellogg, Bull. 160, U.S.N.M., p. 108 states, regarding *S. omiltemanus* that "the hind limb being carried forward along the body, the tibiotarsal joint reaches to between eye and end of snout," showing a shorter leg than this species.

I strongly suspect that the genus *Microbatrachylus* approaches the genus *Eleutherodactylus*, through this form. The testes of the male are black, and the position of the termination of the ventral disk can not be determined. It may be necessary when more is known about this form to refer it to *Microbatrachylus*.

Eleutherodactylus occidentalis, nov. nom.

Borborocoetes mexicanus Boulenger (nec. *Leuiperus mexicanus* Brocchi). Proc. Zool. Soc. London, June 7, 1898, pp. 477, 481, pl. 39, fig. 2, 2 a (Type description; type locality, Hacienda el Florencio, Zacatecas, México, A. C. Buller Coll.); Günther, Biologia Centrali-Americana, Rept. Batr., April, 1900, p. 215 (part).

Eleutherodactylus mexicanus Kellogg (*part.*), Bull. U. S. Nat. Mus., No. 160, 1932, pp. 98–99, 108–112.

This group of Eleutherodactylid frogs is somewhat confused, owing to the fact that two of the species have been named *mexicanus* and placed in two

different genera. That the two species in question are closely related, has been noted by various authors, who have realized that the presence or absence of vomerine teeth was a poor character for the establishing of generic groups.

Unfortunately the exact type locality of *Leuiperus mexicanus* Brocchi is not known. The collector, M. Boucard was known to have collected in southeastern Mexico, so it seems likely that the type came from southern Veracruz, Oaxaca, or Chiapas. A comparison of the western Mexican forms of this group with those from the southeast show very distinct differences, chief of which are that the western specimens have the first finger much longer than second; the vomerine teeth well developed; the inner metatarsal tubercle very large and strongly compressed; and vocal sacs present.

None of these characters are true of the type description of *Leuiperus mexicanus* nor of specimens from Oaxaca which I have referred to the species. In these, the first finger is equal to or shorter than, the second; the metatarsal tubercle is rounded or oval and not compressed; vomerine teeth small or absent, and the limb relatively longer than in the preceding species.

In consequence of these differences I am proposing a name for the western form since the name it now bears is preoccupied.

The following key will serve to distinguish the four species of the *mexicanus* group:

Mexicanus Group of the Genus *Eleutherodactylus.*

This group of four species is characterized by a rather large inguinal gland; a very large inner metatarsal tubercle; the almost complete absence of supernumerary tubercles on sole (save in *occidentalis*); complete absence of webs; no trace of inner tarsal fold or tubercle; vocal sacs usually absent (present in *occidentalis*); vomerine teeth present or absent, usually present but weak.

Key.

A. First finger longer than second; inner metatarsal tubercle strongly compressed, nearly equal to length of first toe; outer tubercle small, about one-fifth size of inner; tibio-tarsal articulation reaches to near nostril; when limbs are folded, heels overlap about two or three millimeters; some supernumerary tubercles on sole and palm; no outer palmar tubercle or pad; tubercles, including those under digits white or cream in color; fifth toe shorter than third, not reaching so far forward; vomerine teeth well-developed; males with vocal sacs; belly smooth, generally; posterior buccal membranes grooved and more or less papillate; testicular membrane white; States of Michoacán, Jalisco, and Nayarit, in Mexico ..... *E. occidentalis nov. nom.*

AA. First finger shorter than (rarely equal) to second; inner metatarsal tubercle not compressed.

B. Tibiotarsal articulation reaches to eye; heels separated two or three millimeters when limbs are folded; fifth toe much shorter than third, reaching forward a shorter distance; inner metatarsal tubercle large, broad and oval, a little shorter than first toe; outer metatarsal tubercle one-fifth of inner; supernumerary tubercles obsolete, on sole, some present on palm; a small outer palmar tubercle touching the median; subarticular tubercles on hand and inner metatarsal tubercle, cream or white, others purplish or dark gray; belly and (sometimes) chin, granular; vomerine teeth present, small, weak; testicular membrane white; buccal membranes grooved or folded strongly, papillate posteriorly; no vocal sacs; skin minutely granular, with some traces of folds; ventral disk distinct; Omilteme, Guerrero (probably also higher parts of the western part of the Sierra Madre del Sur range).

E. calcitrans (Günther)

BB. Tibiotarsal articulation reaching much beyond tip of snout.

C. Inner metatarsal tubercle much smaller than in *calcitrans* or *occidentalis*, oval, less than three-fourths the length of first toe; outer tubercle about one-third size of inner; supernumerary tubercles on palms, none on feet; outer palmar tubercle distinct but fused to the middle one; vomerine teeth small or moderately distinct; palatal membranes folded and papillate posteriorly; metatarsal and subarticular tubercles dark gray to purplish; fifth toe extends as far forward as the third; when limbs are folded, the heels overlap four or five millimeters; belly smooth; disk more or less distinct; tips of digits somewhat more dilated than in *calcitrans;* inguinal gland yellowish; testicular membrane black; male lacking a vocal sac; skin generally smooth with practically no trace of dorsal folds, but traces of granulation posteriorly seen under lens; Omilteme, Guerrero (probably also the higher parts of the Sierra Madre del Sur range in Guerrero).....

E. saltator, sp. nov.

CC. Inner metatarsal tubercle large, double the size of that in *saltator*, and somewhat differently shaped; outer tubercle also relatively

large, about one third inner; heels overlap slightly when limbs are folded; a large outer palmar tubercle or callosity in contact, or partially fused with the middle one; no trace of transverse grooves at tip of digits; skin finely granulate or corrugated; ventral disk slightly areolated on outer edge, with some posterior wrinkling; a row of small tubercles on outer edge of tarsus; vomerine teeth reduced or absent; no trace of transverse terminal grooves on digital pads; vocal sacs absent?; Oaxaca and probably Southern Veracruz and Chiapas.....*E. mexicanus* (Brocchi)